Memory Expansion for Futaba R/C Transmitters

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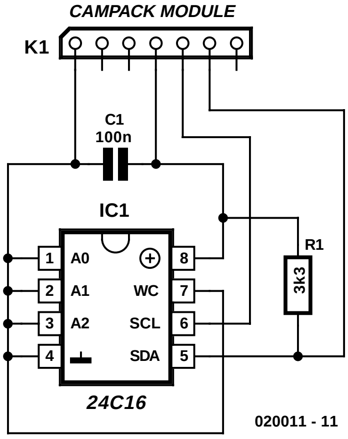

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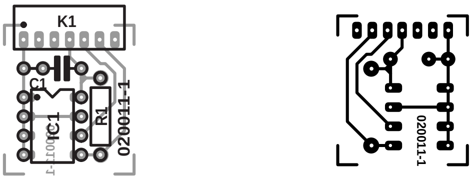

COMPONENTS LIST

Resistors:
R1 = 3kΩ3

Capacitors:
C1 = 100nF

Semiconductors:
IC1 = 24C16

Miscellaneous:
K1 = 7-way connector
(2 mm lead pitch!),
e.g., Farnell # 672-348

In the model buildingworld a lot of transmitters are used with a built-in microprocessor. This processor occupies itself with carrying out, among other things, mixing functions, null point control of the servo, reversal of the servo, etc. This provides two significant advantages. On the one hand there is no need to purchase expensive analogue mixers again, because all of that is now implemented in software. On the other hand, you can use different settings for different models, because the various settings can be stored in non-volatile memory. However, many transmitters have very limited capacity in this respect. If desired, the memory can be expanded by purchasing a memory module. Expansion of the memory has the advantage that you can copy the current settings via the transmitter and then experiment with the settings in order to optimise them without losing the original data.

The circuit diagram, **Figure 1**, shows such a module. This module is intended as a replacement for the CamPack modules for use with Futaba transmitters. It is obvious from the schematic that the circuit doesn't amount to much. The memory element is a 24C16 EEPROM. This device, with a capacity of 2 kilobytes, has an I^{2}C interface, so that only a few connections are required to access it.

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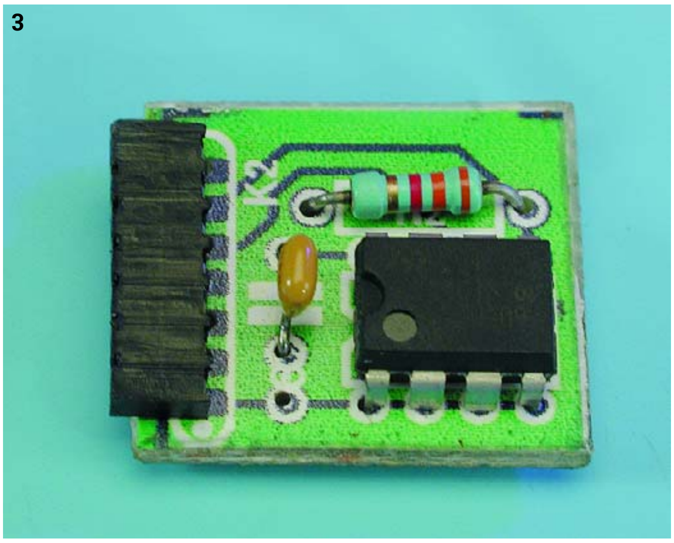
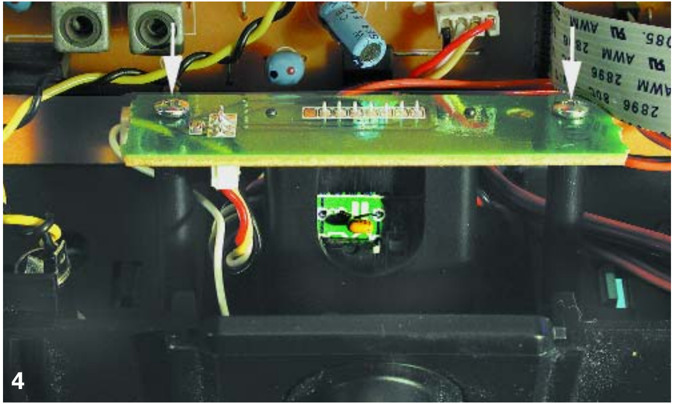


The assembly of the printed circuit board (**Figure 2**) can be accomplished in record time. It is important to note that IC1 (as can be seen in **Figure 3**) is not fitted in an IC socket, otherwise the circuit will not fit inside the transmitter! Also note that the connector used has a pitch of 2 mm, instead of the more usual 2.54 mm! After assembly has been completed (and the PCB has been carefully checked for short-circuits), the circuit can be fitted in the transmitter. The component side of the board needs to point in the direction of the antenna. It will also fit the other way around, but the consequences are less pleasant…

It is rather difficult to install the PCB in the slot in the transmitter that is specifically intended for this purpose, because our PCB is much smaller than the commercially available CamPack. It is therefore much better to take a different approach. First we have to open the transmitter, using exactly the same procedure as when replacing the battery. After this, the two screws that hold the small PCB with the expansion connector have to be removed (**Figure 4**). This small PCB can be found in the vicinity of the antenna. Once this little PCB has been removed it is easy to plug in the memory module (**Figure 5**: note the correct orientation!). Finally, fasten the original PCB again and replace the cover on the transmitter.

As soon as the Futaba radio control transmitter is turned on you will see a message indicating that the memory is being formatted. This takes a while, but only happens the first time. Once formatting has been completed the memory module is ready for use. From now on, instead of the original two,



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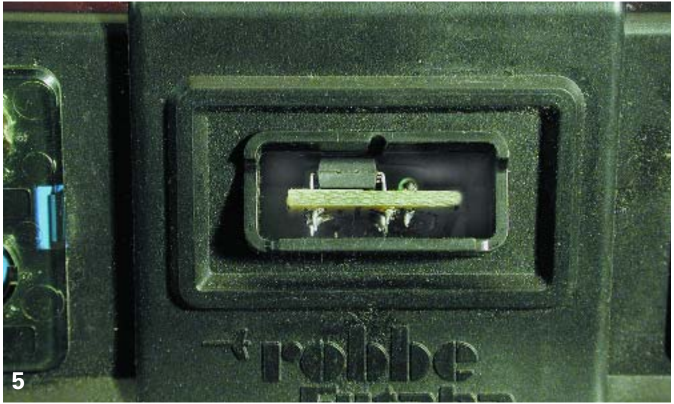

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we are able to store no less than 27 models in memory. Those of you who think that is still not enough can always build additional modules (also useful as back-up for the present settings). The PCB for this project is unfortunately not available ready-made.

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